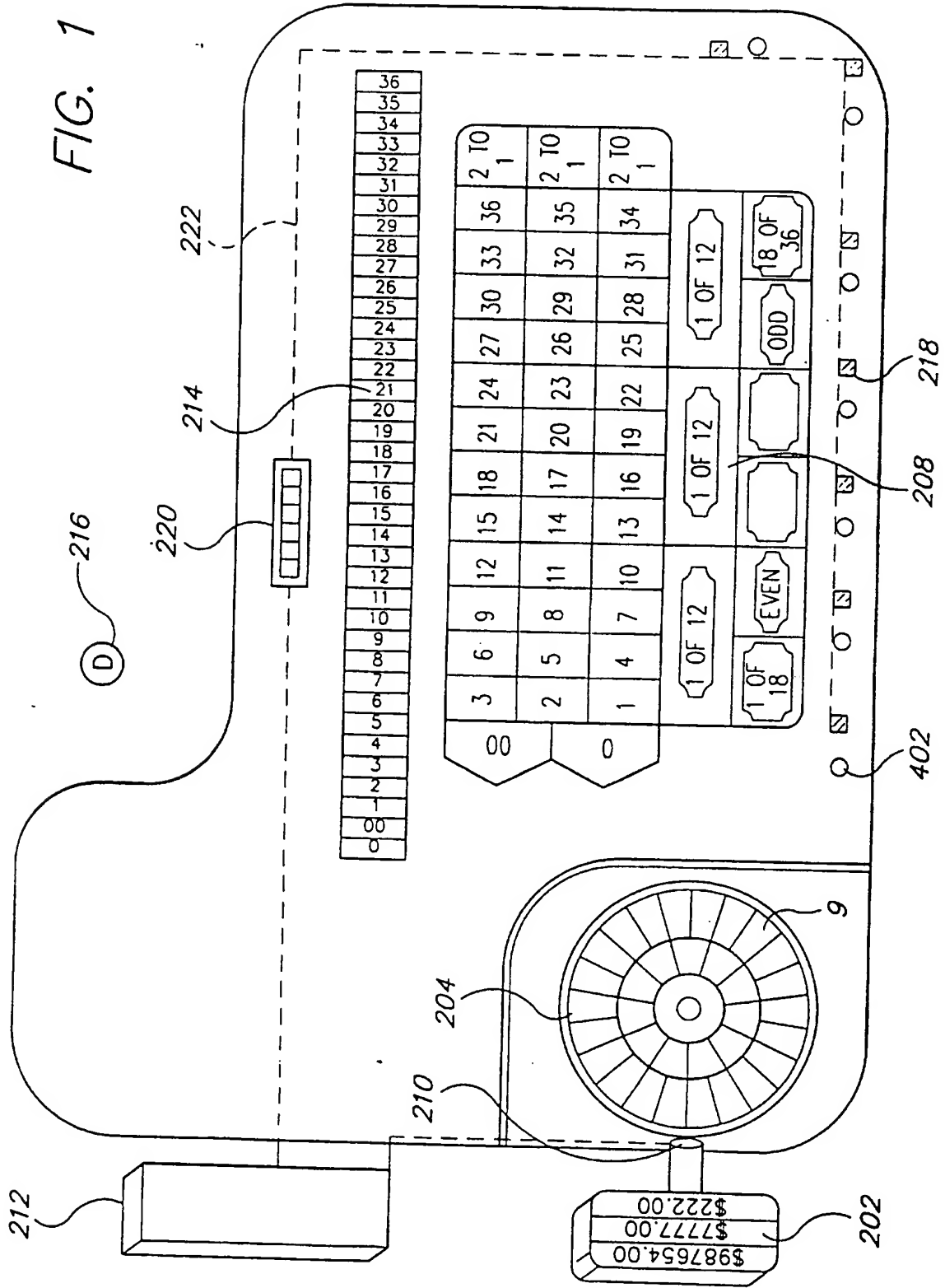


(43) Date of A Publication 10.12.1997

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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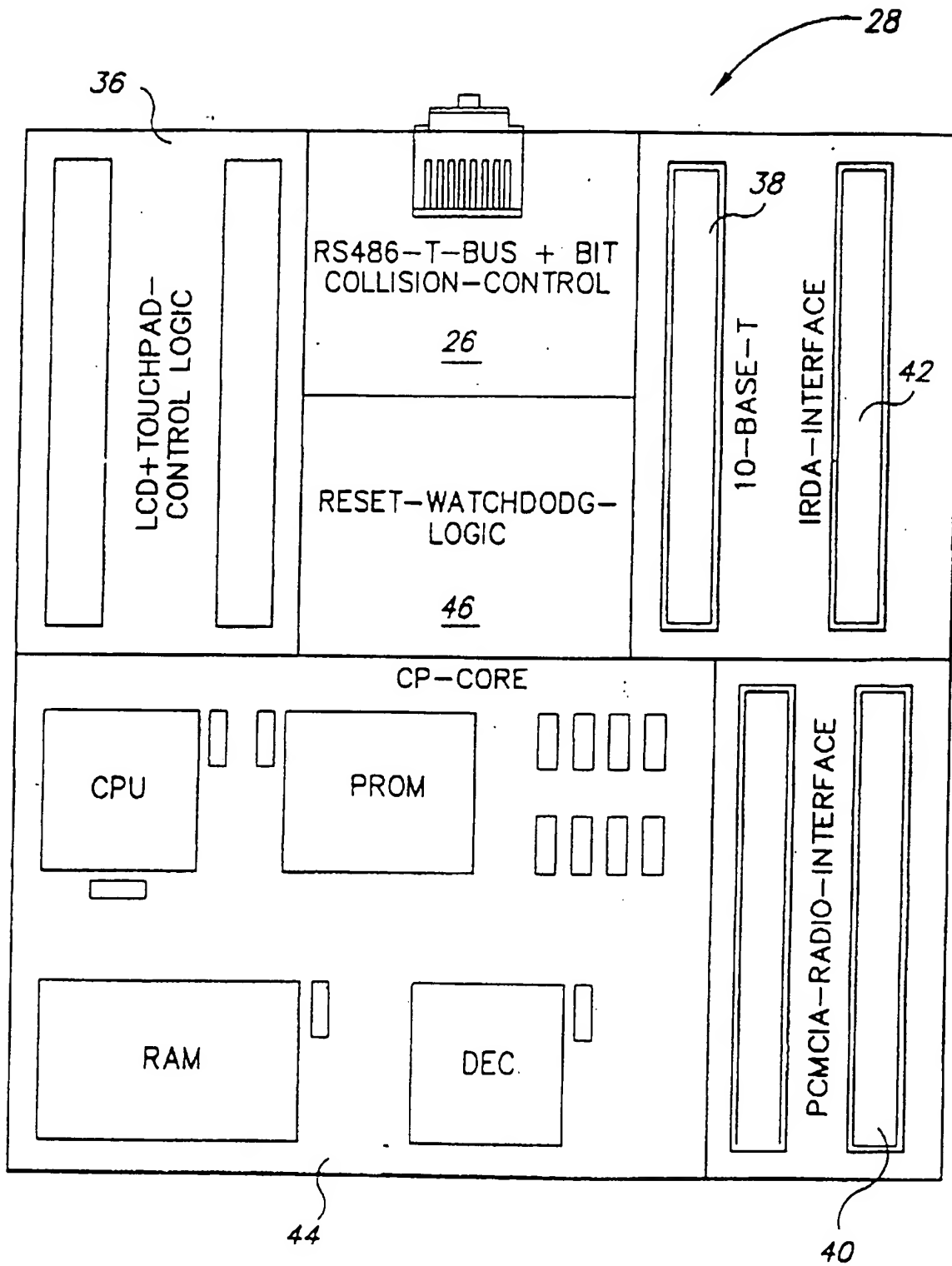


FIG. 3

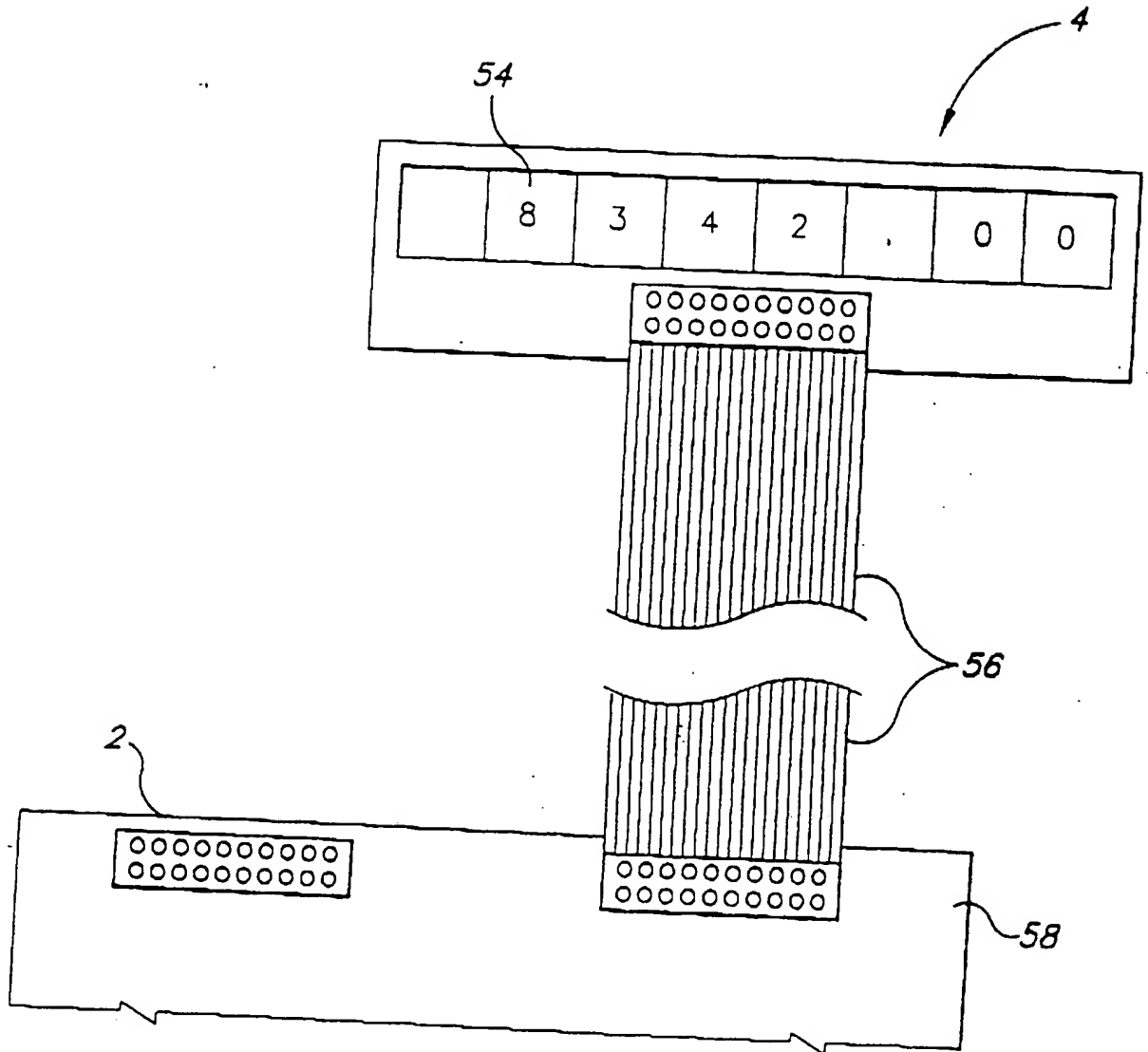


FIG. 4

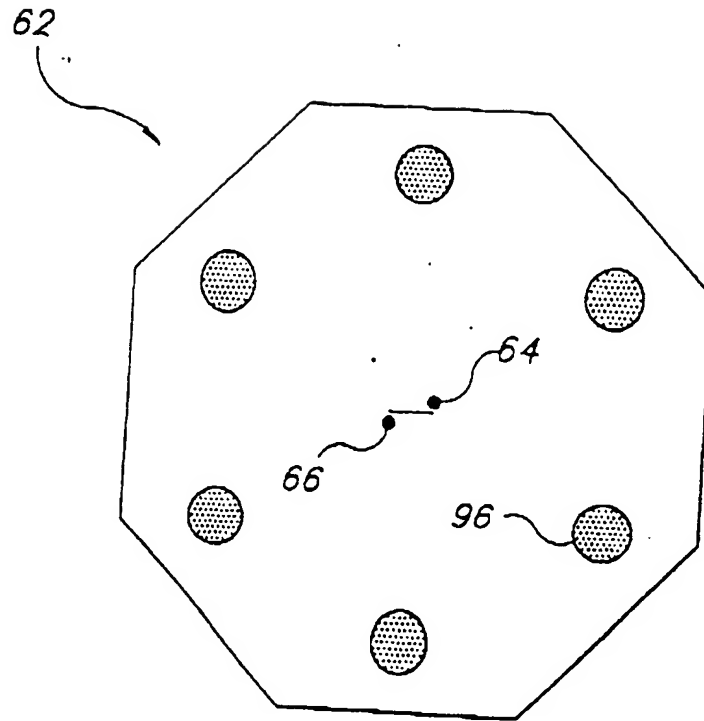


FIG. 5

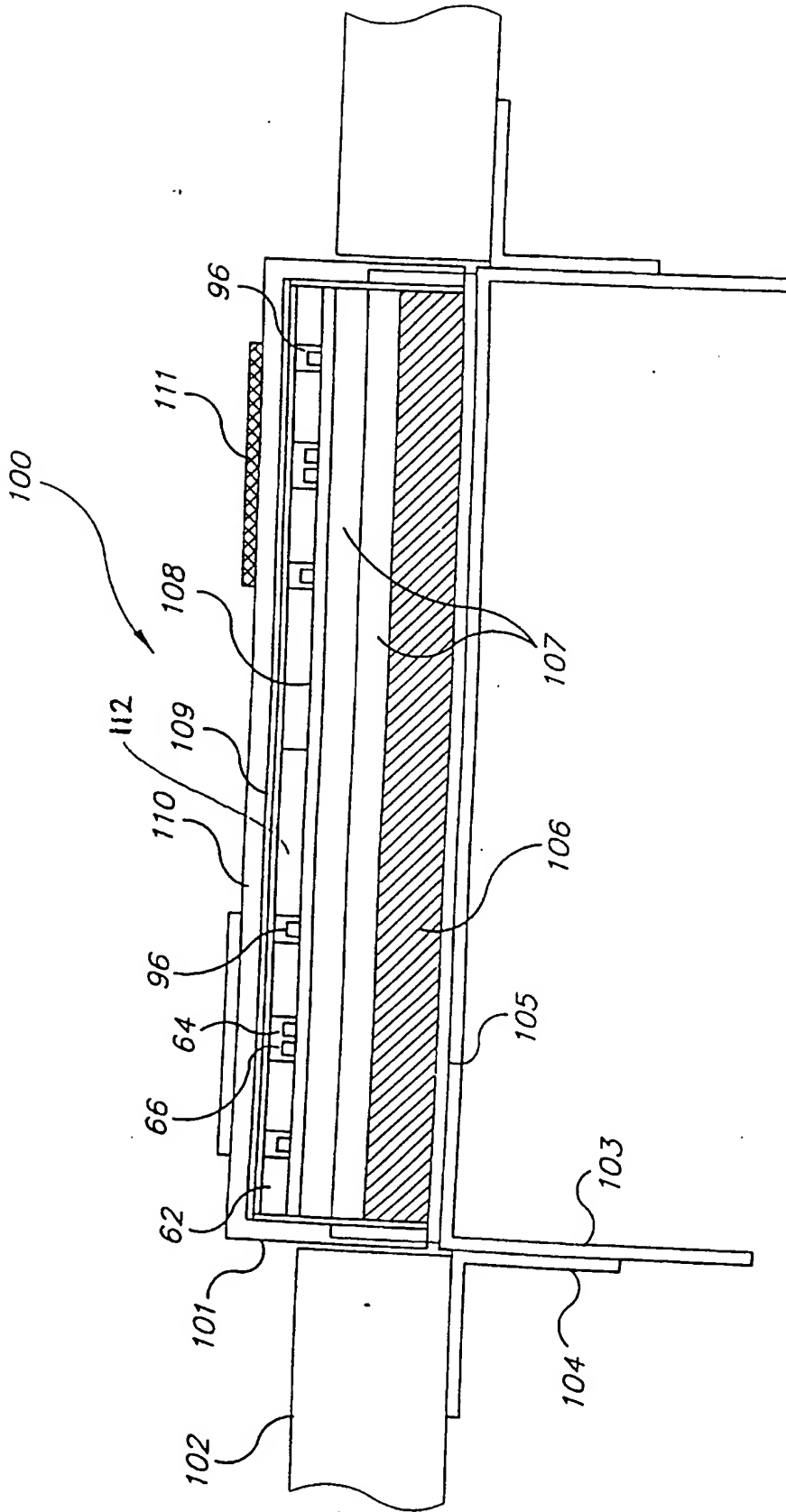


FIG. 6

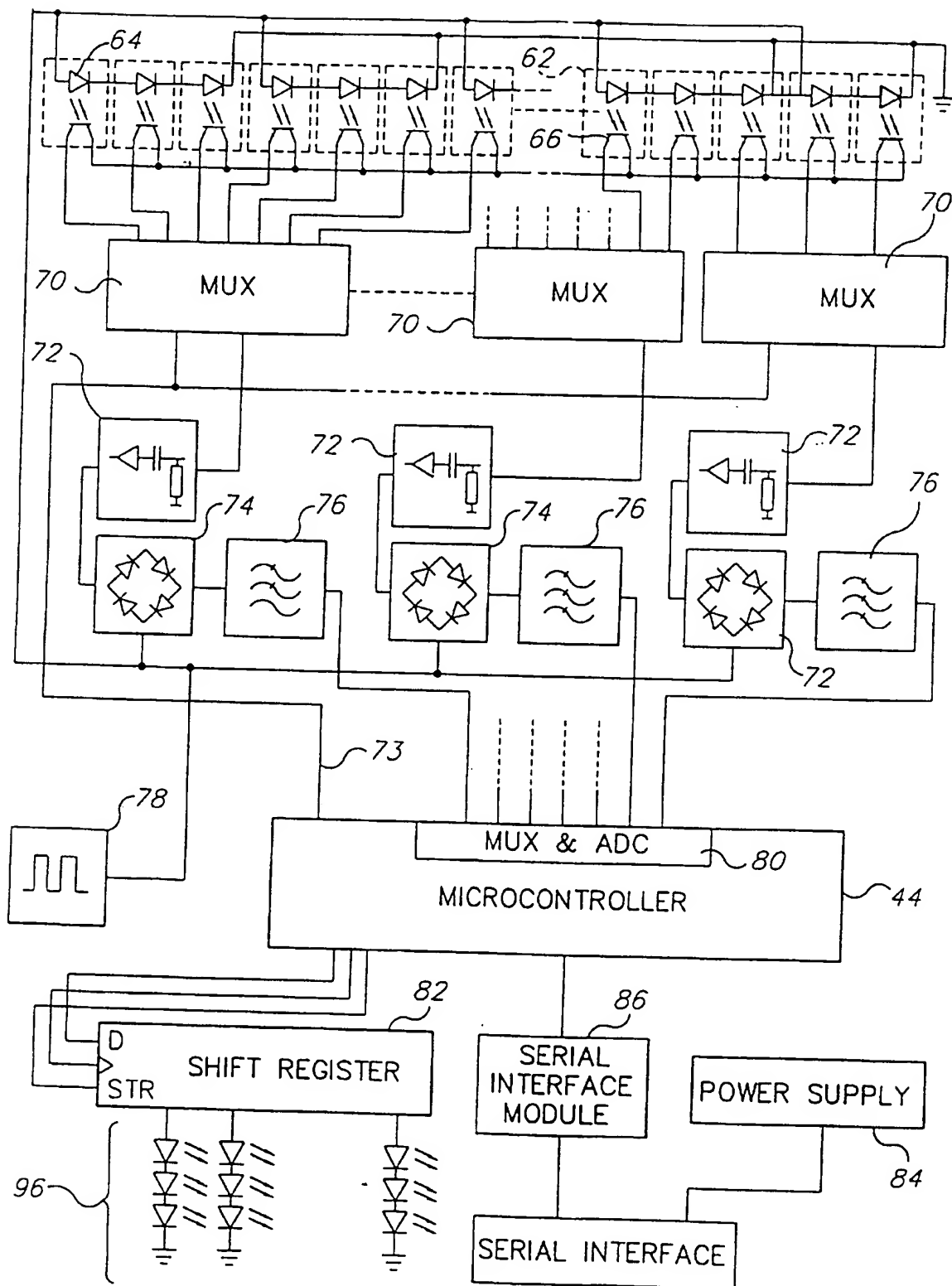


FIG. 7

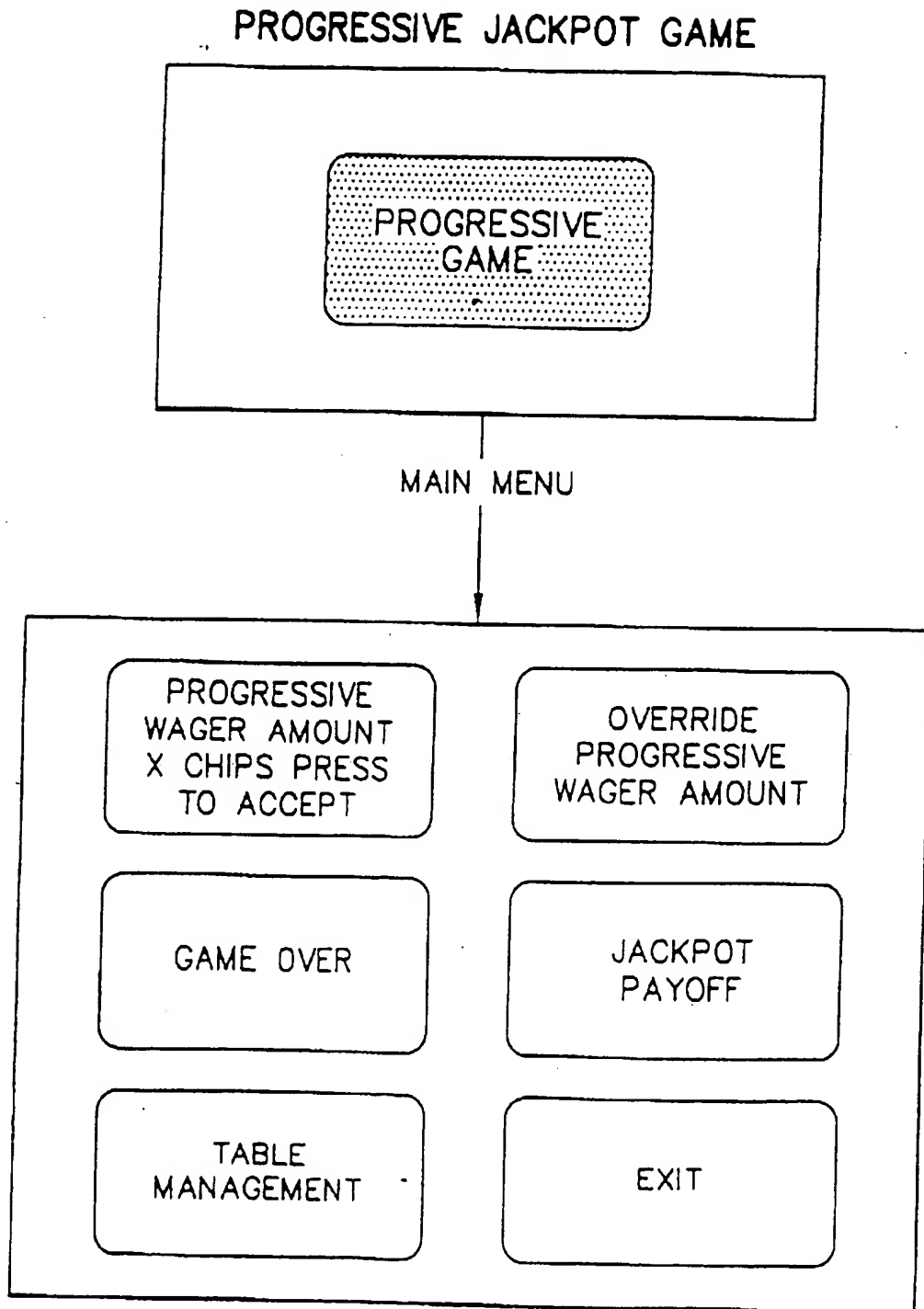


FIG. 8

PROGRESSIVE WAGER AMOUNT

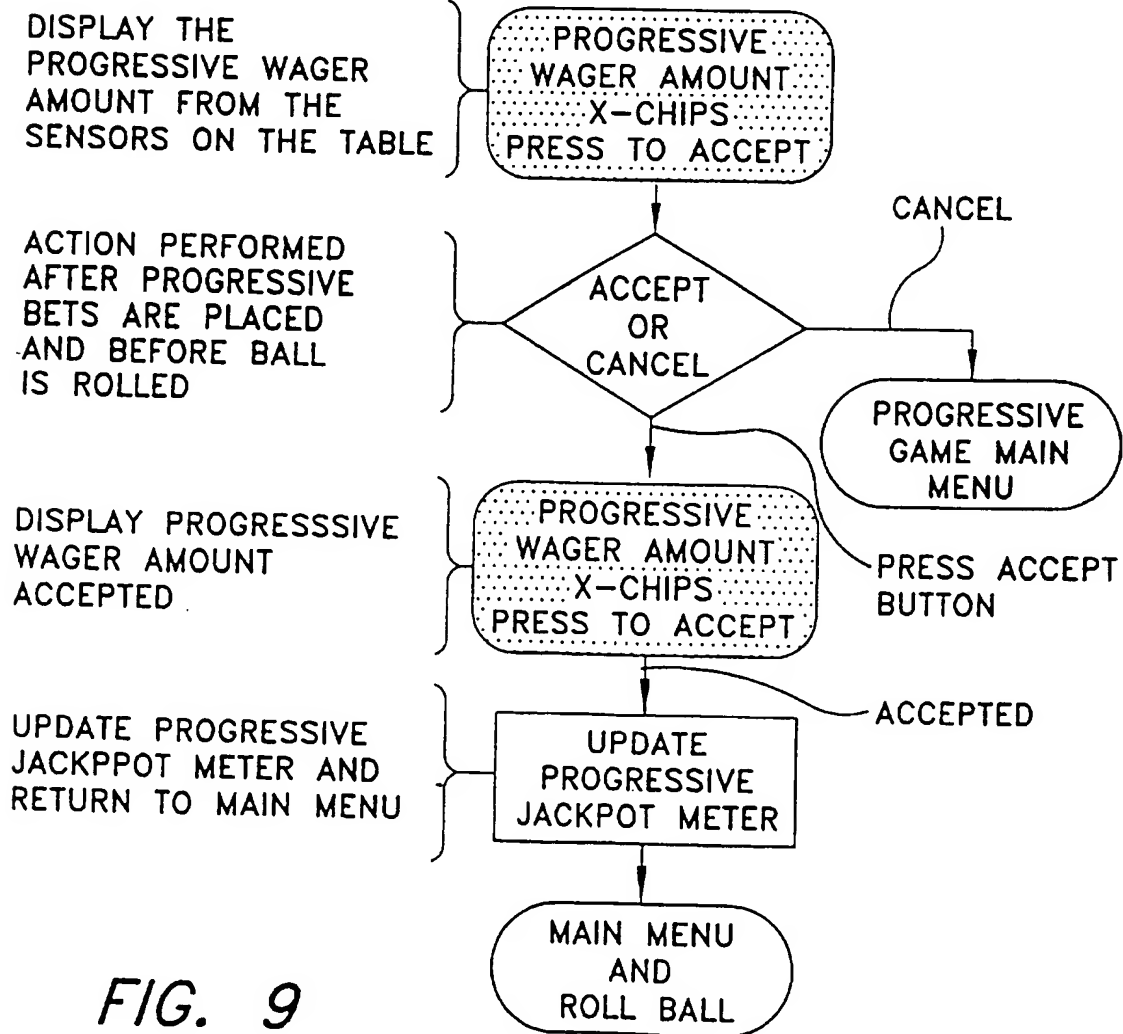
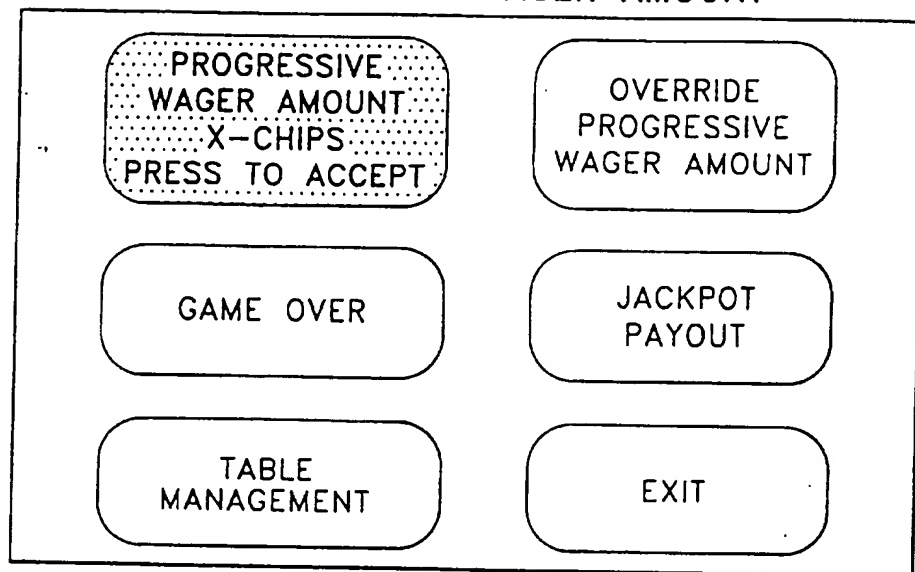
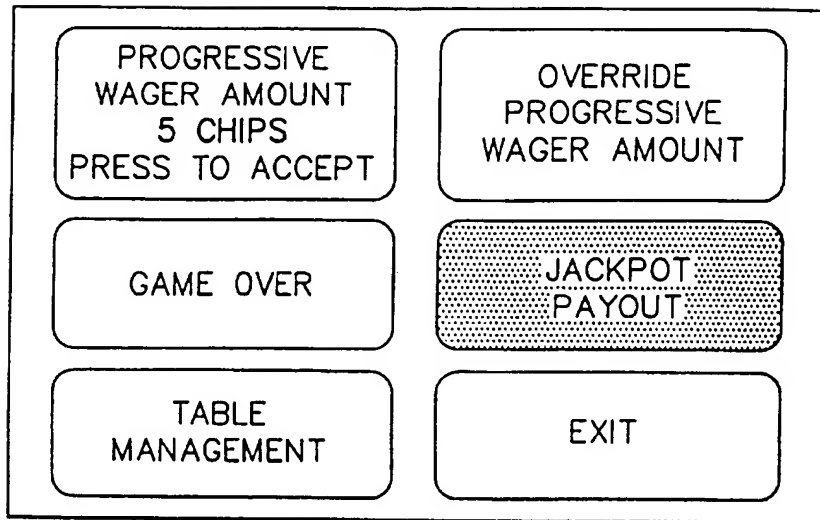


FIG. 9

JACKPOT PAYOUT

FIG. 10



ONCE THE BALL HAS LANDED IN THE SAME POCKET TWICE OR THREE TIMES IN THE SAME POCKET AND A VALID BET WAS PLACED. PRESS JACKPOT PAYOUT

SYSTEM TO VERIFY THAT THE BALL LANDED IN THE SAME POCKET 2 OR 3 TIMES AND A VALID BET WAS PLACED

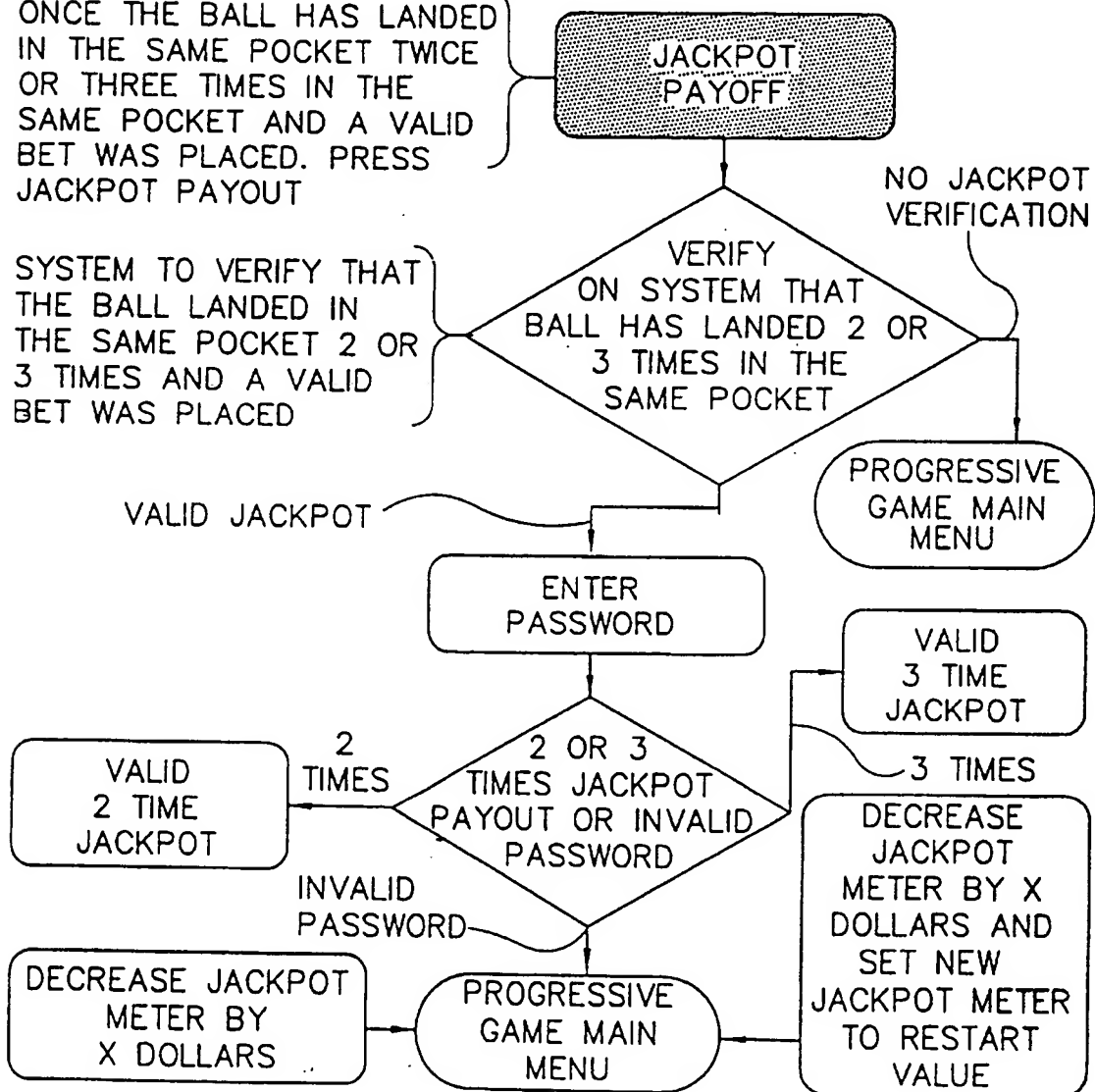


TABLE MANAGEMENT

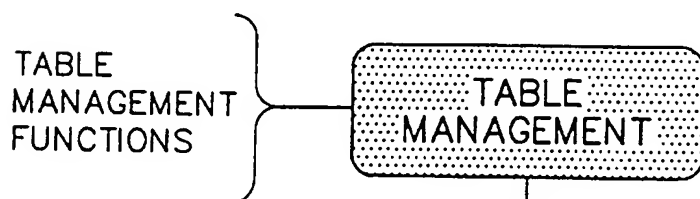
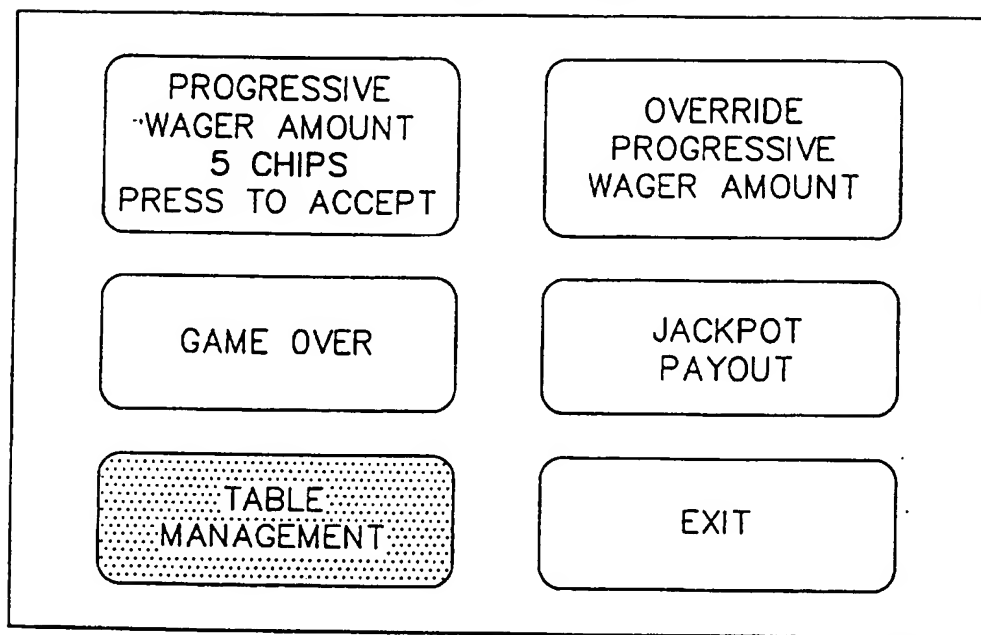


FIG. 11

12\12

TABLE MANAGEMENT

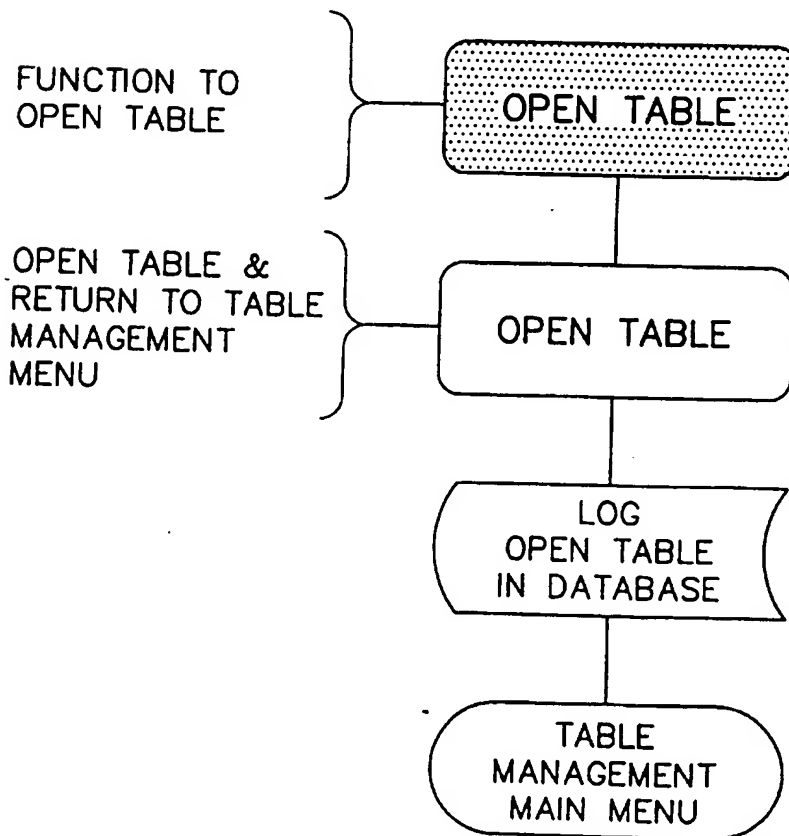
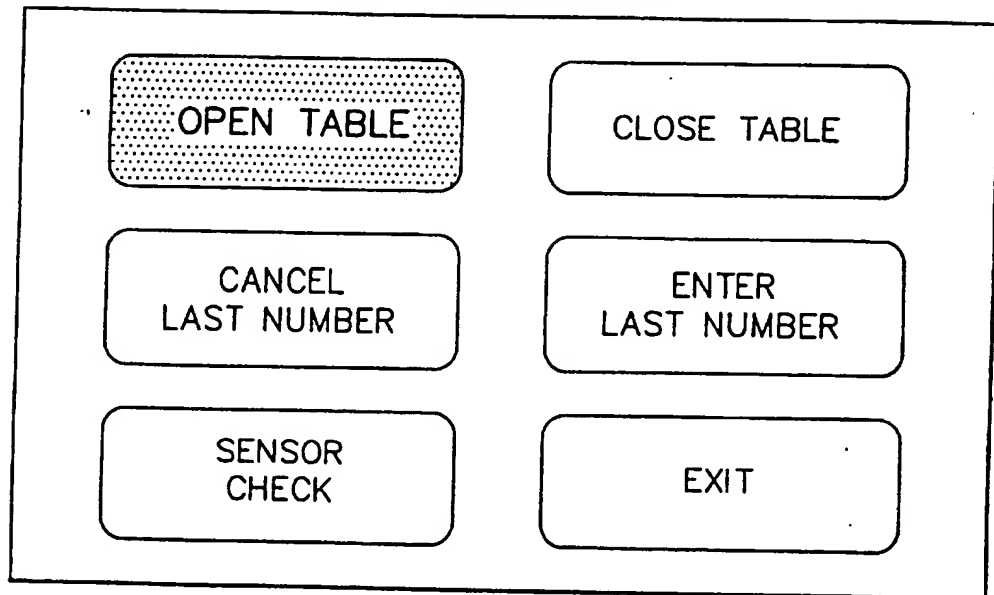


FIG. 12

ROULETTE TABLE HAVING PROGRESSIVE JACKPOTS

This invention relates to apparatus for operating a roulette table. More specifically, the present invention relates to apparatus for operating a roulette table having progressive jackpots.

5 Roulette equipment typically comprises a table upon which is horizontally mounted a well-balanced, compartmented wheel which is spun by a croupier or dealer. The wheel is rotated in one direction and opposite to its rotation the dealer throws a small ball which comes to rest in one of a set of numbered compartments
10 when the wheel slows to a sufficiently low speed. The rotations of the wheel and ball result in a winning number registered by the ball resting in one of the numbered compartments at the rim of the wheel. Bets on a number or set of numbers on the wheel and table layout are typically made by players using chips. A
15 different chip color may be assigned to each player, the chips may have cash values of different denominations, and may be limited to use only on the issuing table.

 Casino card systems, wherein a jackpot progressively accumulates to stimulate greater interest by players, are well
20 known in the art. The prior art relating to progressive jackpot gambling systems includes, U.S. Pat. No. 4,861,041 which discloses a method and apparatus for playing a casino card game such as Poker and Twenty-One having a progressive jackpot component. In the '041 patent, the winning jackpot hands are
25 preselected or predetermined by the house.

 U.S. Pat. No. 5,280,909 discloses a gaming system with a progressive jackpot. The disclosure involves the use of a plurality of gaming machines. The machines are linked together electronically so that in regular play on the machines, players
30 may compete for an additional common award or jackpot. An electronic computer controller determines the selection of the winning jackpot number. The disclosed gaming machines are essentially coin operated slot machines having unspecified operational parameters.

35 U.S. Pat. No. 5,042,810 discloses casino roulette apparatus

using a chip counter to aid in accumulating a jackpot, and a display means for showing the value of a jackpot fund which increases as play progresses. A jackpot is paid out according to a prescribed criteria. The value of the jackpot accumulated is based on the turnover of the roulette table. In other words, the value amount accumulating in the jackpot from game to game is determined and controlled by the house as a function of the total value amount wagered on each roulette game played. Each spin of the wheel and ball constitutes a game. The house may alter and control a specific and particular fraction of "table turnover" (or total monies taken in by the house on each game) introduced into the jackpot as a function of the duration of game play, the total wagers per game and the frequency of jackpot wins.

In playing roulette in the casino according to U.S. Pat. No. 5,042,810, players are given colored chips or small disks when they purchase them from the house to play. They thus "buy into" a game. Different colors are provided to each player. In U.S. Pat. No. 5,042,810, specific numbers are allocated or assigned by the house with or to each color. For example, red is preassigned the numbers 1, 6, 14 and 18. A player becomes eligible to win a jackpot when a number included within the set of numbers associated with that specific color the player plays with is selected by the wheel and ball three or four times in succession. Thus, if the number 6 is selected by the roulette wheel action, and 6 is associated with the color red, then the player eligible to win a jackpot is identified. The player who is playing with red chips. Furthermore, in U.S. Pat. No. 5,042,810 there is only one possible winner in each jackpot. Players have no choice regarding which numbers they desire to play for the jackpot except by asking for a particular color, which may not be an option. Additionally, the game described by U.S. Pat. No. 5,042,810 appears to be inherently unfair to some players since a player who bets substantially more than other players on a consistent basis inequitably contributes more to the jackpot fund than do the players who bet a lesser amount on the average. Furthermore, since the house is obliged to pay out a portion of

its winnings to a jackpot fund, it may be motivated to attempt to increase the volume of play to enable the redemption of monies lost as a result of jackpot contributions for the house.

U.S. Pat. No. 5,540,442 discloses roulette apparatus having
5 a random number generator, a conventional wheel and a secondary playing layout on the table surface. A bet on the secondary layout is won when the numbers on the conventional wheel and the random number generator match.

There is a desire in the casino industry for a roulette
10 system that offers greater possibility for rewards, and that is interesting for the player; but also is easy and economical for the casino management to operate, and is within the scope of the rules and regulations of various government jurisdictions.

It is believed that prior art systems having a form of a
15 progressive jackpot fund have not captured the attention of the casino customer because the prior systems select and assign number(s) or other jackpot goals to the players.

On the other hand, the present invention gives the players
greater control in the selection, betting and payout process.
20 The present invention provides roulette apparatus having progressive jackpot accumulations wherein each player alone may select a potential winning jackpot number.

To achieve the foregoing and other objects and advantages, a
principle object of our invention is to offer to the casino
25 industry apparatus for operating a roulette table having progressive jackpots that is more exciting for players, easier and of greater cost efficiency for casino management to operate, and existing conventional tables are easily convertible into a table embodying the present invention.

It is a further object of our invention to provide a
30 roulette table wherein players have a personal choice regarding their wager on a number in progressive jackpot roulette game.

In accordance with a broad aspect of the present invention,
there is provided apparatus for playing roulette comprising a
35 roulette table including (i) a roulette wheel and ball, (ii) a conventional betting layout with a plurality of numbers thereon

corresponding to the numbers on the roulette wheel, and (iii) a progressive jackpot betting layout having thereon the same plurality of numbers as are on the conventional betting layout. The roulette wheel and ball are operated to play a conventional game of roulette on the conventional betting layout, and to play a separate progressive jackpot game on the progressive jackpot betting layout wherein a jackpot is won by a wagered number winning on a predetermined number of successive spins of the wheel. The apparatus also includes means for generating signals representative of numbers bet on the progressive jackpot betting layout, means responsive to the generating means for indicating bet progressive jackpot numbers and means for sensing the winning number in each spin of the wheel. Means are used by the dealer for marking a winning bet number on the progressive jackpot betting layout to prevent the marked number on the progressive jackpot betting layout from being further wagered until a different number wins to break the order of successive same number winnings or until the jackpot is won by the same bet number winning for the predetermined number of successive spins of the wheel. The apparatus also has means including a computer responsive to the generating means, and the sensing means for accumulating a jackpot fund from the amount wagered on the progressive jackpot betting layout, and for determining when the same bet number wins for the predetermined number of successive spins of the wheel.

In one embodiment means are connected to the computer for displaying the amount of money in the jackpot fund, and the number of successive same number winnings.

In accordance with another broad aspect of the present invention, there is provided a method of playing roulette with the above described apparatus for playing roulette.

As used herein "means for selecting a number from a predetermined group of numbers" includes a typical roulette wheel and ball operated by a dealer, and any automatic device which may have mechanical, electrical and/or computer components such as the random number generator of U. S. Pat. No. 5,540,442 which

selects and displays one of the typical roulette numbers.

In the various embodiments of the invention, bets may be initially made or placed on either the conventional or progressive jackpot betting layouts. However, it is preferred
5 that players be required to first wager on the conventional betting layout before wagering in the progressive phase of the instant game of roulette. The player then places a single chip on any one of the numbers on the progressive jackpot layout. Alternatively, the player may deliver a chip by hand to the
10 dealer and indicate verbally the selected number to the dealer, and the dealer then places the chip on the player's selected number on the progressive jackpot betting layout.

In still another more complex embodiment, a player inserts a single chip in a designated slot on the table felt. The slot is
15 associated with mechanical, electrical, infrared, weight or other means, or combinations thereof to detect the chip and signal to the dealer and/or to a computer that a chip has been played. This action indicates the player's participation in the progressive part of the game.

20 If the next spin of the wheel results in the wheel selecting the same progressive jackpot layout number as it did in the previous spin, a fixed small cash payout (e.g., \$100.00) may optionally be awarded to the player who bet on that number.

25 The present invention is suitable not only for live casino games but also for electronic games and/or combinations of live game and electronic game play. Namely, all or some of the functions of the dealer and the house can be performed by electronic means, with the player allowed to make individual selections of numbers on the conventional and progressive jackpot
30 layouts.

The game is adaptable to a computerized electronic game and inter-active multimedia format, and is also adaptable to computer network or Internet operations.

35 Also, existing conventional tables are readily convertible for use in the present invention by adding a progressive jackpot betting layout to the top of the table, and by locating remaining

components beneath or elsewhere on the table.

For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference to the accompanying drawings and descriptive matter is made in which there are illustrated preferred embodiments of the invention.

Fig. 1 is a top view of one embodiment of the present invention with apparatus of operating a roulette table to play a progressive jackpot roulette game;

Fig. 2 is a top view of another embodiment of a roulette table having apparatus for playing a progressive jackpot roulette game including associated electronic means for tabulation, accounting, display and communication;

Fig. 3 is a block diagram of an electronic table-controller for use in embodiments of the present invention;

Fig. 4 is a view of an electrical connection between a table-controller and a display board used in embodiments of the present invention;

Fig. 5 is a diagrammatical view of an optical sensor device positioned beneath each number for detecting the presence or absence of a chip on the progressive jackpot betting layout.

Fig. 6 is sectional view taken along line VI-VI of Fig. 2 of the progressive jackpot betting layout and the underlying optical sensor devices in accordance with the present invention;

Fig. 7 is a schematic diagram showing circuitry and components relating to an array of the optical sensors beneath the numbers on the progressive jackpot betting layout; and

Figs. 8 to 12 show the screens and corresponding flow diagrams for an input pad through which the dealer manages a roulette table in accordance with the present invention.

With reference to Fig. 1, there is shown a roulette table in accordance with the present invention comprising a wheel 104 and a conventional betting layout 208 (also known as a register, board or chart) wherein in addition to the conventional betting layout 208, a progressive jackpot betting layout 214 typically smaller in size of the conventional betting layout is placed on

the table felt. The dealer is located at position 216, and the players take positions across the table from the dealer in front of slots 218.

The wagering layouts 208, 214 are conventionally placed on the felt by a screen printing method. However, other methods of adhering the smaller progressive jackpot layout 214 may be used. For example, a Velcro type of attachment may be employed. Further, the progressive jackpot layout 214 need not be a design shown in Fig. 1. It may have other shapes and designs such as a race track design. A primary consideration is that in the design selection, it should be such that the dealer is able to efficiently clear the progressive jackpot number layout of losing bet chips without interfering with the chips or indicator markers placed on the winning numbers.

In accordance with the present invention, a player occupies one of a number of player positions (typically 7-positions) at the roulette table. The table also has a number of mutually distinctive sets of chips equal to the maximum number of player positions with each chip having the same value.

The player buys into the play, and the chips the player receives for the use on the conventional betting layout may have various values, but the chips used to play the jackpot games on the progressive jackpot layout typically are purchased at one dollar, and are therefore valued at one dollar, or at a unit value of any recognized currency depending upon the country in which the game is played. Such chips are well known in the art and are conventionally called "non-value" chips which are "valued" as they are purchased by the players and may be identified as "progressive chips". The chips used to play the progressive jackpot game do not have to be a base unit value, but could be a simple multiple thereof. This is to account for the different relative values of currency in the world. The value of some base units of some currencies may be extremely low relative to others, and therefore a simple multiple thereof may be employed. These chips may be used for both normal roulette play and for play in progressive jackpot play.

Each player is assigned a different one of the sets as a source of chips; and may bet the chips on one or more numbers on the conventional betting layout 208, but each player is limited to a single chip wager on each number bet on the progressive
5 jackpot betting layout 114.

Thus in one form, each one of the mutually distinctive sets of chips has both value chips and non-value chips. Each player in this embodiment uses value chips to bet on one or more numbers on the conventional betting layout. Each player may also bet on
10 one or more numbers on the progressive jackpot betting layout, but each player is limited to a single non-value chip wager on each number bet on the progressive jackpot betting layout 114.

Bets may be initially placed on either the conventional or progressive jackpot betting layouts. However, it is preferred
15 that bets are initially placed on the conventional betting layout, and then on the progressive jackpot betting layout.

As noted above, it is preferred that a player enter the progressive jackpot game by simply handing the dealer a single chip, who places it on the selected number on the progressive
20 jackpot betting layout 114. In another preferred embodiment, a player simply places a chip on the selected number. In these instances, the dealer may register the number of chips played into a keypad or input device 220 which transmits data to the computer 212 for processing. Since each player is assigned chips
25 all having a single color or other identifying feature, the dealer knows which players are playing the progressive jackpot game.

In still another embodiment also shown in Fig. 1, a player places or inserts a single chip into a designated slot 218
30 located at the player's playing position on the table felt to play in the progressive jackpot game. This placement indicates participation in the progressive jackpot game and transfers to the house a specific monetary value. The slots may be operatively associated with an electric or electronic chip
35 counter that transfers data to a computer 212.

The chip inserted into the slot 218 in the electronic device

which registers this action and transmits it to the computer 212 and ultimately to a display 202 that is observable by the dealer and others. Fig. 1 represents this communication by dotted lines 222. Still further, a player may actuate a light 402 to transmit to the dealer a decision to play the progressive jackpot game. The dotted line 222 of Fig. 1 may alternately represent wireless communication such as, for example a digitally encoded electromagnetic energy signal.

After a player(s) has indicated play in the progressive jackpot and the dealer has come into possession of the progressive jackpot chip or chips, the display light 402 of Fig. 1 may be activated. The dealer then verifies that the number of chips played in the progressive game match the number of lighted indicator devices adjacent to each player's position.

Following the dealer's verification of the number and the table position of players playing the progressive game, the dealer then requests from each player who has entered the progressive jackpot game, beginning with the player to the dealer's left at the table, and continuing from player to player, left to right in succession, the number on the wheel that each player has selected for the progressive jackpot game to come up for two or more (preferably three) consecutive spins. Since the colored chips used in the progressive jackpot game are the same as the chips a player uses during regular play, the dealer can immediately recognize and identify who is playing.

Upon learning from each player what number on the wheel is being selected for the progressive jackpot, the dealer may place each player's chip on the number selected on the jackpot wagering layout 214 of Fig. 1 located on the table felt near the full sized layout. As noted above, the progressive game layout 214 may be a substantial replica of the larger conventional game wagering layout 208. The reduced replica 214 of the conventional layout 208 may be used and located appropriately with respect to the large chart. Moreover, for greater convenience to the dealer and for other reasons, which will become apparent, and in a more preferable embodiment, the scaled down chart may be located

adjacent to the larger one in a parallel arrangement as shown in Fig. 1. Additionally, since the principle function of the second, smaller layout is to track the betting on the progressive jackpot roulette game, it is possible for the layout to have one of any of several distinctly different designs, so long as all the numbers on the wheel appear also on the progressive jackpot smaller layout." For example, one design might be in the form of adjacent squares forming a long row around the perimeter of a portion of the table.

After all of the bets from every player desiring to participate in progressive jackpot roulette game have been verified and the player's chips have been placed on the progressive jackpot layout, the dealer may announce that progressive jackpot game is closed. The players proceed then to make all bets and standard wagers on the standard roulette table as they desire, and the dealer spins the wheel 104,204 and shoots the ball. However as noted above, the players may initially bet on the conventional layouts 8,208 and then bet on the progressive jackpot layout 14,214 before the wheel is spun.

After the wheel comes to rest, indicating a specific winning number, the dealer places a glass marker or other marker device on the table felt directly above that number on the progressive jackpot layout 214. Another type of marker may be used on the larger conventional betting layout 208 for the standard roulette game. Then, the dealer clears all of the losing bets from both the conventional wagering layout 208 and the progressive jackpot wagering layout 214. Next, the dealer makes the payout(s) on winning bets made on the standard wagering layout 208.

If any player or players have bet same number on the progressive game layout 214 as selected by the roulette wheel, the glass marker remains in place resting on top of the winning chip or chips on the progressive jackpot layout. The glass marker remains in place during the next spin of the wheel.

The chips representing all other losing bets on the progressive layout 214 are cleared from the table by raking and are collected.

The player or players having their chips on the winning number advance to the second round of the progressive jackpot roulette game. A player or players who won in the first round and whose chip or chips remain on the winning number is not
5 required to place a new wager in the progressive jackpot game to continue to play in the jackpot.

When a number chosen by a player on the progressive layout 214 is first selected by the wheel, the chip remains on the winning number and no other player thereafter may select the same
10 number until the spins of the roulette wheel either produce or fail to produce a winning consecutive sequence of numbers. Thereafter, wagers on the progressive jackpot portion of the game, and the entire progressive jackpot game process is repeated. It should be emphasized at this point that all of the
15 conventional bets that are made in the regular or conventional roulette game can be made on every spin of the wheel.

However, if the second spin of the wheel results in the roulette wheel selecting the same number as rolled on a first spin, the dealer then may substitute a different marker for the
20 marker used to identify the number rolled on the first spin. For example, a red glass marker for a first used glass marker of another color. In addition to having a color difference, the glass markers may also have a visual configurational and tactile difference to further identify which round of play in the
25 progressive game is in progress. For example, the marker may be in the shape of a numeral such as the numeral 2, for example and may have a specific "feel".

This substitution of one marker for another by the dealer signals to the players and to the casino management or overseer
30 that the progressive game wager has progressed (or advanced) through the second round of the progressive jackpot game. At this point in the play, the dealer may make the casino management aware of the status of play, so that the winning consecutive spin of the wheel may be verified by persons and/or an electronic
35 monitor responsible for so doing. The public and casino management announcements of successive rounds through which a

player has progressed may be accomplished by electronic means.

If a number is rolled in the third round which is different from the number rolled on the two previous consecutive spins, all the losing wagers on the progressive jackpot are again cleared from the table and collected by the dealer. Since the chips are all of unit value amount, a counting device need only count the number of chips to tabulate continuously the amount accumulating in the jackpot fund. Counting is done electronically by a conventional chip counter. Data from the counter is registered in the computer memory 212, from which it can be manipulated by appropriate software to portion out winnings in various rounds of the progressive game, to monitor the amount in the payout jackpot and in a second, residual jackpot fund maintained for the purpose of giving the house the ability to introduce new money into the payout jackpot if such jackpot becomes suddenly depleted by a final round. Of course, in a preferred embodiment a counter need not be used in the dealer collection process of losing conventional bets in the present invention because only player participation in the progressive game results in tabulating the progressive jackpot fund.

However, if the same number is again rolled on the final spin (preferably the third spin) in a series in which the two consecutive previous spins produced the same number, the progressive jackpot total, or specified fraction thereof, is paid to the player or players who selected the number that was rolled three consecutive times. In the case where more than a single player bets on the same number, the jackpot is shared equally between all winners.

Should the jackpot be won, a replacement or residual jackpot fund preferably will automatically seed or partly replenish the jackpot fund to maintain player interest in continuing to play roulette. The replacement jackpot fund may be funded from either a portion of all player contributions, or by a fixed or percentage amount dictated by the casino. The proportions of payout and retention may easily be automatically and continuously controlled by the house using conventional computer programs or

special utility software.

The house may have payouts on the winning number at each level of the jackpot game. For example, there may be a small payout for winning the first jackpot roll. This player when winning the second round may then receive another relatively small payout. This player when winning the final round would receive a very large percentage of the total fund because of the high odds against consecutive winning with the same number. For conventional U.S. playing, the odds against winning on two consecutive spins are $38^2:1$, for three consecutive spins $38^3:1$, and on four consecutive spins $38^4:1$.

There are essentially two different wheel designs used in commercial casinos throughout the world. The British and European wheels typically have 36 numbers and one zero, or 37 possible outcomes, while the American version has 36 numbers, a zero and two zeros (0 and 00), or 38 possible outcomes.

Electronic means, standard in the art and commercially available, may be used for tabulating jackpot totals and displaying same on a visual or audio-visual display panel, visible and/or heard by players and non-players near the tables or in the casino. For example, one such supplier and manufacturer of displays is Dynamic Displays, Inc., 3435 E. 44th St., Tucson, AZ. Known devices such as optical and electronic detecting means, scanners, laser means and/or electromagnetic means associated with appropriate electronic circuits and switching devices, programmable computer central processing units, memories, and the like may be used to make embodiments of the present invention operate efficiently and easily.

Electronic, computing and also display components for the embodiments disclosed herein are available from Grips Electronic Ges. m.b.H.; Mariatroster Strasse 41; A-8043 Graz, Austria.

However, a specific aspect of the present invention involves the display and broadcasting to interested persons in a casino and elsewhere that progressive jackpot rounds have advanced through different levels, and that a potential winner at some specific location is becoming eligible to win a jackpot. Such

broadcasting can be carried out by the display board 202 reversing itself from light indicia on dark background to dark indicia on light background or visa-versa. It is believed that in no other casino game is there a provision for announcing and broadcasting the fact of a potential winner. Typically, such an announcement occurs only after a player has won an award or jackpot. Such broadcast or announcement may be affected by using a computer and related electronic equipment. Moreover, such a broadcast, prior to a possible winning number jackpot, would create further interest among casino customers.

Further, the roulette tables in any one casino may be electronically linked together so that jackpot build up includes more than one table in a casino. Moreover, electronic link-ups or networks from multiple tables and from multiple casinos situated at locations distant from each other may be used or employed to further increase the number of participating players and the size of the jackpot.

With reference to Fig. 2, there is shown another embodiment of a roulette game with progressive jackpots in accordance with the present invention. This embodiment is operated in a manner that is functionally similar to the tables of Fig. 1, and play is essentially the same. The roulette table comprises a wheel 6 and a conventional betting layout 8. In addition to the conventional betting layout 8, a progressive jackpot betting layout 14, smaller in size than the conventional wagering layout, is placed on the table felt. The dealer typically is positioned at 16, and the players take positions at player positions 10 generally across the table from the dealer.

The progressive jackpot layout need not be a design indicated by 14 in Fig. 2. It may have other shapes and designs such as a race-track loop. A consideration regarding the design of the progressive jackpot layout is that it should be one that allows the dealer to efficiently clear the progressive jackpot wagering layout of the losing bet chips without interfering with the chips or indicator markers placed on the winning numbers.

Following the spin of the wheel and the production of a

winning number, the losing chips must be cleared from the table from both the conventional betting layout 8 and the jackpot layout 14. Accordingly, it is advantageous to have the progressive jackpot layout 14, raised slightly above the table surface, e.g., from 1/4 to 3/8 inches, to allow raking of losing chips from the conventional wagering layout without interfering with the chips placed on the progressive wagering layout.

As discussed above, a player may simply deliver a single chip by hand to the dealer, who then places it on the selected number on the progressive jackpot layout 14, or the player may place the chip directly on the selected number on the progressive jackpot layout 14. When the dealer directly receives the chips, the dealer may register the number of chips played on the progressive layout into a keypad or input device 20 which transmits data to a computer 28 for processing. The dealer then places these chips on the bet numbers on the jackpot layout 14.

Other means for indicating to the house that a player is playing the progressive game include electronic, weight, radiation and IR sensitive sensors or any other type of sensors located directly under the number positions in the progressive jackpot betting layout. In another embodiment, a player's indication to play in the progressive jackpot game is made by the player (or the dealer) placing a chip on the progressive jackpot layout 14 beneath which are electronic sensing devices and associated electronic apparatus for detecting or sensing the presence and location of the chip(s). The sensors generate signals in response to a chip being placed on the numbers of the progressive jackpot layout.

After a player has indicated an intention to play in the progressive jackpot and the dealer has come into possession of the progressive jackpot chip, or a chip has been sensed as being placed on a specific jackpot number, or after a progressive jackpot bet has been electronically registered, a display light (such as Fig. 1, 402) optionally located adjacent to each player's position is activated.

A preferred embodiment of the present invention includes

electronic means for operating the game. Referring to Fig. 2, reference numeral 4 is a progressive jackpot display, 2 is a roulette display (SD16), 22 an optical reader, and 28 is a table-controller. The progressive jackpot layout 14 has an underlying sensor field 62 (Figs. 5&7). The number indicated by the resting ball on the roulette wheel is detected by the optical reader 22 and sent to the table-controller 28 by a global table bus (T-BUS) 26. Each number so read is stored in the memory of the table-controller 28 and also is displayed on the roulette display 2. The progressive jackpot display 4 is mounted above the roulette game display 2, and is controlled or operated through a display controller 58 of the SD16 roulette display 2 and a 20-pin flat ribbon cable 56 shown in Fig. 4. The table-controller 28 causes the jackpot display 4 to display an increase in the jackpot with every lost bet. The bets on the progressive jackpot betting layout 14 are sensed and sent over T-BUS line 26 and stored in the on-board memory of the table-controller 28. If more than one player places chips on the same number in the progressive jackpot betting layout 14, the dealer must correct the number of the detected chips by using the dealer input pad 20.

The progressive jackpot display 4 comprises an 8 x 64 pixel matrix 54 in Fig. 4, and displays the actual value of the table's progressive jackpot. The microcomputer in the table-controller 28 is programmed to increase the jackpot value displayed whenever bets made on the progressive jackpot layout field lose. In this case, data are sent to the roulette display controller 58 for the roulette display 2 (SD16) through T-BUS 26 and displayed on the progressive jackpot display 4 which is connected to the display controller 58 (Fig. 4) with the 20-pin connector flat ribbon cable 56. If a player has bet on the number selected by the ball and wheel rotation, the dealer places a marker, such as a glass marker, on the winning number on the progressive jackpot layout 14. If the same number wins again on the next spin, a payout is optionally made, and if the same number also wins on the third successive spin, a jackpot is paid out to the appropriate player

or players.

5 The roulette display 2 shows a predetermined number of preceding winning numbers (for example 16). Whenever a winning number is determined by the wheel two or more times in succession, that number is highlighted by color inversion and/or flashing. Communications from the optical reader 22 and the jackpot layout 14 to the table-controller 28 pass through the T-BUS 26 (RS485).

10 After the ball rests in a pocket 9 on the wheel, an optical reader 22, conventional in the art, detects the number registered by the ball. Following two spins of the wheel and ball to avoid false readings by seeing transient states caused by the ball falling into a numbered pocket, the reader transmits a coded signal to the table-controller 28, and the table-controller 28
15 stores the number in memory, and compares the number to the stored numbers of the bets made on the progressive jackpot betting layout 14. This control guarantees that payout to an invalid win will not be made, or that the dealer will not accept a bet made late on a winning number. An alarm (not shown) will
20 sound in the event of a failed comparison.

An embodiment of the table-controller 28 is shown in Fig. 3, and it controls sending and storing data throughout the system. It functions as a server controller via a 10-Base-T 38, radio transmission 40 or IRDA 42. The table-controller 28 includes a
25 CPU kernel 44,46 with watchdog, powerfail, decoding logic, and a memory for storing all needed data. The table-controller 28 through a touch-terminal 36 also controls an optional graphic display and touch pad (not shown) and the touch-pad 20 that is used by the dealer to input data. The T-BUS 26 connects to the
30 table-controller 28 through a RS485-Interface.

Each number position on the progressive jackpot layout defines a field, and a sensor 62 (Figs. 5 to 7) is located under each field. As shown in Fig 6, the progressive jackpot layout is a rectangular insert 100 located in a cutout portion 101 of the
35 table top 102. The insert 100 is located on a mounting plate 103 that is secured to the table top 102 by mounting brackets 104.

The insert includes a ground plate 105, foam rubber 106, and two spacer plates 107. A layer of PCB 108 holds the sensors 62 and the components of the sensors upwardly into holes formed in a background light distributing plate 112. A foil 109 has the progressive jackpot layout numbers printed thereon, and the insert is enclosed by a plexiglass cover 110. A chip 111 is shown resting on number position "18" on the progressive jackpot layout.

The sensors 62 each have an infra-red transmitter 64 and receiver 66. Whenever one or more chips are placed on a number field 216, six light emitting diodes (LED) 96 begin flashing about the number to signal to the dealer and other players that the number was chosen for progressive jackpot play. The numbers represented by the individual fields are stored in the memory of the table-controller 28. If necessary, the dealer uses the input pad 20 (Fig. 2) to input to the table-controller 28 the correct number of chips placed on a field, and thus indicating that there are different players playing the same number. The microcomputer of the table-controller 28 is programmed to cause the LEDs 96 of the field sensor 62 to flash rapidly when the number selected by the wheel matches one of the player selected progressive jackpot numbers, and the LEDs for all other bet numbers are switched off. The dealer places a marker over the number with the flashing LEDs 96.

The sensors 62 illustrated in Figs. 5 to 7 and used for chip detection are reflective object sensors which are located beneath each bet field. To reduce the influence of ambient light, modulated infrared radiation is used. The modulation frequency is provided by a clock generator 78, which is used to drive the infrared emitter diodes 64 of the reflective object sensors 62. The receivers (phototransistors 66) which pick up the reflected IR-light are connected to a detection circuit 72, 74, 76 via a multiplexer 70. The first stage of the detection circuit is a preamplifier with a high pass filter 72, which filters out the DC-component caused by the ambient light. The amplified signal is passed to a synchronous demodulator including a mixer 74 and a

low pass filter 76, which converts the modulated signal into a DC voltage. The output signals of the demodulators are measured with an internal A/D converter 80 of the microcontroller 44.

To reduce the multiplexing rate of the analog circuitry and thus to increase the scanning speed, several demodulator circuits are used in parallel. The microcontroller 44 generates the multiplexer control signals 73, measures the signals from the reflective object sensors 62 and compares them to internally stored thresholds to decide whether or not a chip is on the corresponding bet field.

In summary, the reflective object sensor consists of two separate elements, an infrared emitting diode 64 and a phototransistor 66, both in a PLCC-2 package. This package was chosen, because it has a solid opaque body with a window on top. It offers relatively good optical decoupling (the light from the transmitter does not shine directly into the receiver), when two elements are placed side by side. These elements are standard components, available from various manufacturers such as Siemens or Temic. This sensor resides in a hole in the light distribution plate, as shown in Fig. 6.

The IR-LEDs are constantly emitting modulated IR light (modulated by the clock generator 78). The light shines through the foil 109 and the plexiglass cover 110. The intensity of the reflected light is measured via the phototransistors 66. If a chip lies on the sensor, the intensity of the reflected light increases.

The detector uses a synchronous rectifier, which consists of a mixer 74, driven by the own clock signal and low pass filter 76. This circuit converts the components of the input signal with equal frequency and zero phase shift to the own clock into a DC-voltage.

Components of different frequency are mixed to a frequency equal to the clock and their own frequency. If the difference is high enough, the residual frequency is filtered out by the lowpass. For this reason, the light of the blinking LEDs (much slower than the modulation frequency) can cause no serious

interference.

The microcontroller 44 also has to manage the serial communication via the Table Bus. To keep the interface flexible, a replaceable interface module 86 is used. The indicator LEDs 96 which are placed around each bet field are driven by a shift register 82 that is controlled by the microcontroller 44.

With reference to Figs. 8 to 12, there is shown the various options that the dealer has for managing the table with the input pad. Choosing "Progressive Game" on the initial menu raises the Progressive Jackpot Main Menu which has 6-options as shown in Fig. 8. The options are:

(1) Progressive Wager Amount-Press to Accept is used when the wager amount detected by the sensors is accepted and used to update the jackpot meter as shown in Fig. 9.

(2) Override Progressive Wager Amount selection is used when the wagered amount detected by the sensors is corrected by the dealer, e.g., because there has been more than one bet on at least one number. The corrected value is used to update the jackpot display or meter.

(3) Game Over normally acts as a display. It is highlighted when the optical reader detects a number on the roulette wheel to show that the system has detected the end of the game. If a jackpot has occurred, the dealer has to press the Jackpot Payout key to confirm the jackpot. If the optical reader does not detect a number for any reason, the dealer needs to press the Game Over key to end the game manually. This will bring up another screen, where the dealer has to enter the current winning number. This is necessary, because the Table Management functions, which also contain a key to enter the last number, normally would not be accessible by the dealer.

(4) Jackpot Payout shown in Fig. 10 is used to verify and authorize a jackpot payout after two and three successive same number selections by the roulette wheel.

(5) Table Management when selected as shown in Fig. 11 opens a sub-menu displayed in Fig. 12. The sub-menu provides access to functions for opening and closing the table, correcting

false detections of the optical reader, and checking and calibrating the sensors in the bet field. The Open Table function opens the table for gaming, generates a log entry, and makes the gaming functions of the Progressive Jackpot menu of Fig. 7 accessible. The Close Table function disables all functions (except service functions such as "Sensor Check"), and generates a log entry.

(6) Exit selection is used to return the screen to Progressive Game shown in Fig. 7.

As discussed above, a jackpot fund preferably is accumulated solely from the amount wagered on the progressive jackpot betting layout. As used herein, "accumulated solely" contemplates optionally initially seeding the jackpot fund with a predetermined amount of funds after each jackpot payout, and thereafter accumulating the jackpot fund solely from the amount wagered on the progressive jackpot betting layout.

The roulette table itself may be replaced by a slot machine and computer device, or may comprise a hybrid live game and electronic game.

WHAT IS CLAIMED IS:

1. Apparatus for playing roulette comprising;

a roulette table including (i) means for selecting a number from a predetermined group of numbers, (ii) a conventional betting layout with a plurality of numbers thereon corresponding to the numbers on the number selecting means, and (iii) a progressive jackpot betting layout having thereon the same plurality of numbers as are on the conventional betting layout; said number selecting means being operated to play a conventional game of roulette on said conventional betting layout, and to play a separate progressive jackpot game on the progressive jackpot betting layout wherein a jackpot is won by a wagered number winning on the progressive jackpot betting layout for a predetermined consecutive number of operations by said number selection means;

means for generating signals representative of numbers bet on the progressive jackpot betting layout,

means responsive to said generating means for indicating bet progressive jackpot numbers.

means used by the dealer for marking a winning bet number on the progressive jackpot betting layout to prevent the marked number on the progressive jackpot betting layout from being further wagered until a different number wins to break the order of successive same number winnings or until the jackpot is won by the same bet number winning for said predetermined number of operations of said number selecting means;

means for sensing the winning number on operations of said number selecting means; and

means including a computer responsive to said generating means, and said sensing means for accumulating a jackpot fund from a portion of the wagers, and for determining when the same bet number wins for said predetermined number of successive operations by said number selecting means.

2. The apparatus of claim 1 wherein said number selecting means is a roulette wheel and ball.

3. The apparatus of claim 2 wherein said accumulating means accumulates the jackpot fund from a portion of the amount wagered on the progressive jackpot betting layout.

4. The apparatus of claim 2 wherein the signal generating means comprises a sensor beneath each number on the progressive jackpot betting layout for detecting when a chip is placed on the number.

5. The apparatus of claim 2 further comprising the progressive jackpot layout being laterally spaced from and above the conventional betting layout.

6. The apparatus of claim 2 wherein said progressive jackpot betting layout includes a number surface having the plurality of numbers thereon, and said generating means includes beneath each number on said number surface an upwardly emitting signal transmitter and a companion signal receiver; and wherein a chip placed on any one of the plurality of numbers on said number surface reflects the signal from the respective transmitter therebelow to the companion receiver to generate the signal representative of the number being bet.

7. The apparatus of claim 6 wherein said upwardly emitted signal is an infrared wave.

8. The apparatus of claim 2 wherein said bet indicating means include blinking lights beneath each number on said number surface.

9. The apparatus of claim 2 wherein the jackpot fund is initially seeded with a predetermined amount of funds after each jackpot payout.

10. The apparatus of claim 2 wherein said predetermined

number of successive spins is three.

11. The apparatus of claim 2 wherein said accumulating means accumulates said jackpot fund solely from a predetermined percentage of the amount wagered on the progressive jackpot betting layout.

12. The apparatus of claim 10 wherein said accumulating means accumulates a second jackpot fund to provide an intermediate payout whenever the same wagered winning number comes up for a second predetermined number of successive spins of the wheel that is less than said predetermined number of successive spins.

13. The apparatus of claim 2 wherein said roulette table further comprises a number of player positions, and an equal number of mutually distinctive sets of chips, and each player is assigned a different one of the sets as a source of chips; and wherein each player optionally bets on one or more numbers on the progressive jackpot betting layout, and each player is limited to a single chip wager on each number bet on the progressive jackpot betting layout.

14. The apparatus of claim 3 wherein said roulette table further comprises a number of player positions, and an equal number of mutually distinctive sets of chips with each chip having the same value, each player is assigned a different one of the sets as a source of chips, and each set of chips having valued chips and non-valued chips; and wherein each player uses valued chips to bet on one or more numbers on the conventional betting layout, and each player may bet on one or more numbers on the progressive jackpot betting layout, but each player is limited to a single non-value chip wager on each number bet on the progressive jackpot betting layout.

15. The apparatus of claim 3 wherein bets are initially placed on either the conventional or progressive jackpot betting

layouts.

16. The apparatus of claim 14 wherein bets are initially placed on the conventional betting layout, and then on the progressive jackpot betting layout.

17. The apparatus of claim 2 further comprising means beneath the progressive betting layout for detecting bet progressive jackpot numbers, and for indicating to the dealer bet progressive jackpot numbers.

18. The apparatus of claim 12 further comprising means connected to said computer for displaying the amount of money in the jackpot fund, and the number of successive same number winnings.

19. A method of playing roulette with a system including (i) means for selecting a number from a predetermined group of numbers, (ii) a first betting layout for playing a conventional game of roulette, said first betting layout having thereon a plurality of numbers corresponding to said predetermined group of numbers, and (iii) a second betting layout for playing a progressive jackpot game, said second layout having thereon the same plurality of numbers as are on said first betting layout; said method comprising the steps of:

(a) players making wagers on said first betting layout to participate in a conventional game of roulette and/or on said second betting layout to participate in a progressive jackpot game, said progressive jackpot game being won by a same wagered number being selected by said number selection means for a predetermined number of successive operations of said number selecting means;

(b) operating said number selecting means to select a winning number;

(c) paying any winning wagers on said first betting layout;

(d) accumulating a jackpot fund from a portion of said wagers; and

(e) repeating steps (a) to (d) until said same wagered number in said progressive jackpot game is selected by said number selecting means for said predetermined number of successive operations.

20. A method of playing roulette on a roulette table which comprises a top surface configuration including (i) a roulette wheel and ball, (ii) a conventional betting layout with a plurality of numbers thereon corresponding to the numbers on the roulette wheel, and (iii) a progressive jackpot betting layout having thereon the same plurality of numbers as are on the conventional betting layout, said method comprising the steps of:

(a) players making wagers on the conventional betting layout to play a conventional game of roulette;

(b) players optionally making wagers on the progressive jackpot betting layout to participate in a separate progressive jackpot game wherein the jackpot is won by a same wagered winning number coming up for a predetermined number of successive spins of the wheel;

(c) a dealer spinning the wheel, shooting the ball and identifying the location of the ball on the wheel at the end of the spin to determine a winning number;

(d) the dealer marking the winning number on the progressive jackpot betting layout with a second marker;

(e) accumulating a jackpot fund from the amount wagered in step (b) on the progressive jackpot betting layout;

(f) the dealer clearing all losing wagers from the conventional betting layout, and leaving only winning wager(s) on the conventional betting layout;

(g) the dealer clearing all losing wagers from the progressive jackpot betting layout, and leaving only winning progressive wager(s) on the progressive jackpot betting layout;

(h) the dealer paying any winning wagers on the conventional betting layout;

(i) the dealer removing the first marker from the conventional betting layout, and the dealer removing the second marker from the progressive jackpot betting layout if there is no

winning wager on the progressive jackpot layout in step (c);

(j) if there is a winning wager on the progressive jackpot betting layout in step (c), the dealer leaving the second marker on the marked number on the progressive jackpot betting layout to prevent the marked number on the progressive jackpot betting layout from being further wagered for the next spin, the marked number on the progressive jackpot betting layout not being further wagered until a different number wins in step (c) to break the order of successive same number winnings or until the jackpot is won by the same number winning for said predetermined number of successive spins of the wheel;

(k) repeating steps (a) to (j);

(l) if the spin of repeated step (c) produces the same winning number in succession, the dealer leaves the second marker on the winning number on the progressive jackpot betting layout or substitutes a third distinctive marker for the second marker to indicate that the winning number has now been rolled in succession; and

(m) if necessary, repeating steps (a) to (l) until the same wagered winning number in said progressive jackpot game comes up for said predetermined number of successive spins of the wheel, whereupon the jackpot fund is paid out.

21. The method of claim 20 wherein only players making wagers on the conventional betting layout are permitted to optionally make wagers on the progressive jackpot betting layout to participate in the progressive jackpot game.

22. A game comprising:

means for generating a winning number from a predetermined group of numbers;

a first betting layout having thereon a plurality of numbers corresponding to said predetermined group of numbers;

a progressive betting layout having thereon a plurality of numbers corresponding to said predetermined group of numbers;

first betting selection means for enabling a player to place a bet on a number in the first betting layout;

progressive betting selection means for enabling a player to place a bet on a number in the progressive betting layout;

a progressive jackpot for accumulating a fund equivalent to a proportion of the total amount of bets made on the progressive jackpot layout;

first payout means for paying winnings to a player who has selected the winning number on the first betting layout; and

progressive payout means for paying the a proportion of the contents of the progressive jackpot to a player who has selected the winning number on the progressive betting layout, provided that said winning number is generated in a predetermined number of successive operations of said number generating means.

23. A game according to claim 22, wherein the number generation means comprises a roulette wheel and a ball.

24. A game according to claim 22 or 23, wherein the first betting selection means comprises at least one first playing counter.

25. A game according to claim 24, wherein the first betting selection means comprises at least two first playing counters of different value.

26. A game according to claim 24 or 25, wherein the size of the bet made by a player is dependent on the number and/or value of said first playing counters placed in the first betting layout.

27. A game according to any one of claims 22 to 26, wherein the progressive betting selection means comprises at least one progressive playing counter.
28. A game according to claim 27, wherein the progressive betting selection means comprises a single progressive playing counter.
29. A game according to claim 27 or 28, when dependent upon on of claims 24 to 26, wherein the or each progressive playing counter is distinguishable from the or each first playing counter.
30. A game according to any one of claims 24 to 29, comprising a plurality of player positions and a number of sets of playing counters equal to the number of player positions, each set of playing counters being distinguishable from the other sets of playing counters.
31. A game according to any one of claims 22 to 30, wherein the use of the progressive betting selection means is restricted to players who have placed a bet using the first betting selection means.
32. A game according to any one of claims 22 to 31, wherein said predetermined number of successive operations of said number generating means is three.
33. A game according to any one of claims 22 to 32, wherein said progressive betting layout is smaller than said first betting layout.
34. A game according to any one of claims 22 to 33, further comprising means for marking the progressive betting layout if the winning number has been selected by a player's progressive betting selection means on the progressive betting layout, in order to indicate that no further bets can be placed on the progressive betting layout until either: (1) said number generating means generates said winning number said predetermined number of times; or (2) said number generating means generates a number different from said winning number.

35. A game according to any one of claims 22 to 34, wherein said progressive jackpot is seeded with a predetermined amount of fund after said winning number has been successively generated said predetermined number of times.

36. A game according to any one of claims 22 to 35, further comprising a second progressive jackpot for accumulating a fund equivalent to a proportion of the total amount of bets made on the progressive jackpot layout; and second progressive payout means for paying a proportion of the contents of the second progressive jackpot to a player who has selected the winning number on the progressive betting layout, provided that said winning number has been generated in a second predetermined number of successive operations of said number generating means, said second predetermined number of operations being less than said first predetermined number of operations.

37. A game according to any one of claims 22 to 36, further comprising sensing means adapted to sense bets placed on the progressive betting layout.

38. A game according to any one of claims 22 to 37, further comprising display means for displaying the amount of the funds in the progressive jackpot.

39. A game according to any one of claims 22 to 38, wherein the progressive betting layout is spaced laterally from and above the first betting layout.

40. A game according to any one of claims 22 to 39, wherein said first payout means comprises at least one playing counter, the total value of said playing counter or playing counters being equal to the winnings of the or each player who has selected the winning number on the first betting layout.

41. A game according to any one of claims 22 to 40, wherein said progressive payout means comprises at least one playing counter, the total value of the playing counter or playing counters being equal to the proportion of the contents of

progressive jackpot that is paid to the player who has selected the winning number on the progressive betting layout.

42. Apparatus substantially as herein described with reference to and as shown in the accompanying drawings.

43. A method substantially as herein described with reference to and as shown in the accompanying drawings.

44. A game substantially as herein described with reference to and as shown in the accompanying drawings.



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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A6H (HJH, HJM, HJX)

Int Cl (Ed.6): A63F 3/00, 5/00, 5/02, 5/04

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB2227946A (TECHNICAL CASINO) - whole document	1, 22
X,P	US5540442 (ORSELLI) - whole document	1 to 44

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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